

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization  
International Bureau



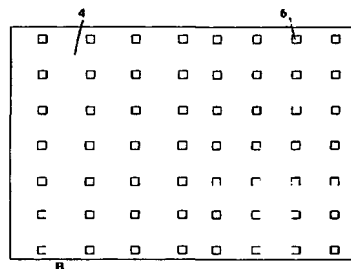
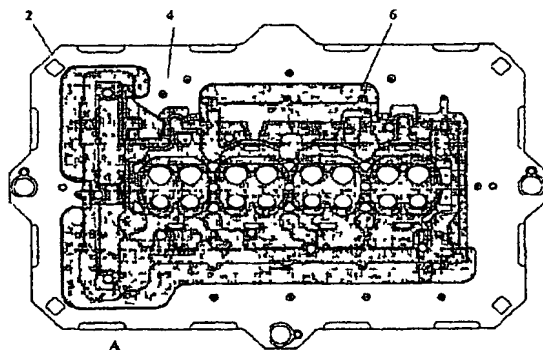
(43) International Publication Date  
24 March 2005 (24.03.2005)

PCT

(10) International Publication Number  
**WO 2005/025779 A3**

- (51) International Patent Classification<sup>7</sup>: B22F 3/105, B29C 33/10
- (21) International Application Number: PCT/US2004/029236
- (22) International Filing Date: 9 September 2004 (09 09 2004)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data: 60/502,068 11 September 2003 (11 09 2003) US
- (71) Applicants (for all designated States except US): EX ONE CORPORATION [US/US], 8075 Pennsylvania Avenue, P.O. Box 1111, Irwin, PA 15642 (US) GENERAL MOTORS CORPORATION [US/US], GM Powertrain, Mail code 486-805-013, 1629 N. Washington Avenue, Saginaw, MI 48340-2920 (US)
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): RYNERSON, Michael, L. [US/US], 100 Oxford Drive, Apt. 701, Monroeville, PA 15146 (US) HETZNER, James [US/US], 3590 Calumet Drive, Saginaw, MI 48603 (US) FISHER, Judith, L. [US/US], Judith L. Fisher, 523 Susanna Court, Pittsburgh, PA 15207 (US) MAAS, Daniel, J. [US/US], 11833 Four Lakes Drive, S. Lyon, MI 48178 (US) NELSON, Donald, R. [US/US], 47495 Warren, Canton, MI 48187 (US) VOSS, Lawrence, J. [US/US], 126 Venango Court, New Kensington, PA 15068 (US)
- (74) Agent: LIZZI, Thomas, IP & Internet Law North, LLC, P.O. Box 38, Zehentople, PA 16063-0038 (US)
- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW
- (84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)
- Published:  
— with international search report  
— with amended claims
- (88) Date of publication of the international search report: 20 October 2005
- Date of publication of the amended claims: 23 February 2006
- For two letter codes and other abbreviations, refer to the "Guide to the Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette

(54) Title: LAYERED MANUFACTURED ARTICLES HAVING SMALL-WIDTH FLUID CONDUCTION VENTS AND METHODS OF MAKING SAME



(57) Abstract: The invention utilizes a layered manufacturing process to produce an article (2) having at least one small-width fluid conduction vent (6) produced during the layered manufacturing process. Such small-width fluid conduction vents (6) may have any desirable cross-sectional shape, orientation, and curvature. The invention also includes articles (2) containing at least one small-width fluid conduction vent (6) wherein the article (2) and the small-width vent or vents (6) are simultaneously produced by a layered manufacturing process.

BEST AVAILABLE COPY